



Science News-Letter

The Weekly Summary of Current Science

A Science Service Publication



Edited by Watson Davis
Vol. XI No. 301

10¢ a copy \$5 a year
January 15, 1927

BIOLOGY

Evolution Fights Loom

With the legislative bodies of forty States opening their sessions before the middle of January, educators are expecting a fusilade of anti-evolution bills similar to those already on the books of Tennessee and Mississippi, and are considering means for the defense of their liberty to teach. At the meeting of the American Association of University Professors in Philadelphia, it was stated that legislation opposed to science will be introduced in at least seventeen legislatures, though it is not expected that the bills will get far in the majority of them.

The first storm is expected in Arkansas, where a bill modeled after the Tennessee statute was prepared several months before the opening of the legislative session. Biologists admit that this State is quite likely to join the list of those where evolutionary teaching is under the ban of prohibitory law. Other States in the South where anti-evolutionary measures may be offered are Alabama, Missouri and the Carolinas; and, in the North, small but influential reactionary groups in Minnesota and the Dakotas constantly threaten action. Whether Indiana will be the scene of a fight is expected to hinge largely on the remaining strength of the Ku Klux Klan there, which is wholly a matter of guesswork. The same holds true in the northern Pacific Coast States, until recently regarded as among the chief citadels of the Klan. California, with its swarm of odd small sects and isms, will almost certainly see a "monkey bill," and will almost certainly kill it in committee. Kentucky and Louisiana killed their bills last year, and their legislatures do not meet again until 1928.

The American Association of University Professors is preparing to take a hand in the struggle. At their recent meeting the following resolution was passed:

"Resolved: That the American Association of University Professors

MATHEMATICS



DR. GEORGE D. BIRKHOFF, professor of mathematics at Harvard University, whose paper, "A Mathematical Critique of Some Physical Theories," given at the Philadelphia meeting of the American Association for the Advancement of Science, was judged by a committee of non-mathematicians to be the most important of the meeting, and was awarded the \$1,000 prize.

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take the initiative in bringing about a more effective cooperation between groups of organizations interested in opposing legislative restriction on freedom of teaching in State supported institutions and in defending the separation of church and state in educational matters."

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METEOROLOGY

New Wind Record Set

A new record for wind velocity recorded by weather bureau instruments was hung up in the Miami hurricane on September 18, 1926, according to Benjamin C. Kadel, in charge of instruments at the Weather Bureau in Washington. At 7:40 a. m. on the day of the storm the wind blew with a speed of 132 miles an hour.

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CHEMISTRY

New Chemical for Boilers

Diphenyl oxide, a white chemical with a powerful reek like geranium scent raised to the nth degree, is the newest stunt in the efforts of engineers to get double work out of every shovelful of coal that goes into the firebox. The trick consists simply of using the chemical in one boiler to run one engine, and then using the exhaust vapor from that engine, still very hot, to raise steam from ordinary water in a second boiler, according to Dr. H. H. Dow, manufacturing chemist of Midland, Mich. Dr. Dow has been experimenting with one of these bi-fluid boiler systems for some months, and states that it has proven itself quite successful and very economical of fuel.

The idea of getting double use from the original firing of fuel was tried first with mercury as the liquid in the first, or high-temperature boiler. From certain points of view this metallic liquid is almost ideal, but its great weight and considerable initial expense, together with constant losses, interposed engineering and economic difficulties. Furthermore, any leakage of mercury vapor is almost certain to be injurious to the workmen in the plant, because mercury is exceedingly poisonous. For these reasons, therefore, Dr. Dow sought for another liquid that would be light, cheap, and non-poisonous, and still have high capacity for carrying heat over into the second boiler to generate steam for the second engine.

A number of organic chemical compounds were found to possess these qualities, but at the temperatures used in boilers they tended to break apart into other compounds useless for power purposes and to clog the boilers with carbonaceous materials of no use for carrying heat. Diphenyl oxide, however, has been used and recondensed and used over again many times at a pressure of 200 pounds per square inch, and a temperature of 800 degree Fahrenheit, with but little de-

(Just turn the page)

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New Boiler Chemical

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terioration. It weighs but little more than water, as contrasted with mercury, which is heavier than lead. Its price is only 30 cents a pound in quantity lots, which according to Dr. Dow makes its cost, volume for volume, less than two per cent. that of mercury. The compound has been produced hitherto in comparatively limited quantities, because its only use has been in the perfume industry, but Dr. Dow states that there is no limit on the bulk that can be manufactured if it is desired for power plant uses.

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It is now believed that our universe is wafer-shaped and travels edgewise through space with all its stars and solar systems.

The cry of "unclean" mentioned in the Bible probably refers to syphilis rather than to leprosy, says one writer on the subject.

Prices of mother-of-pearl shells in the Society Islands have dropped so low that diving has been restricted to raise the price.

The highest point to which a British airplane would climb recently with a wooden propeller was 16,000 feet; with metal, 18,300.

To increase parking space in Dallas, some sidewalks have been cut back to six foot width, leaving triangular peninsulas at block corners.

All molecules of matter are in constant rapid motion, except at absolute zero which is 491 degrees Fahrenheit below the freezing point of water.

A recent inquiry revealed only six famous men who slept only four hours a night: Dumas, Dvorak, Cuvier, Bismarck, Linnaeus, and von Humboldt.

News-Letter Features

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SCIENCE NEWS-LETTER, The Weekly Summary of Current Science. Published by Science Service, Inc., the Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Publication Office, 1918 Harford Ave., Baltimore, Md. Editorial and Executive Office, 21st and B Sts., N. W., Washington, D. C. Address all communications to Washington, D. C.

Entered as second class matter October 1, 1926, at the postoffice at Baltimore, Md., under the act of March 3, 1879. Established in mimeograph form March 13, 1922.

Subscription rate—\$5.00 a year postpaid, 10 cents a copy. Ten or more copies to same address, 6 cents a copy. Special reduced subscription rates are available to members of the American Association for the Advancement of Science.

Advertising rates furnished on application.

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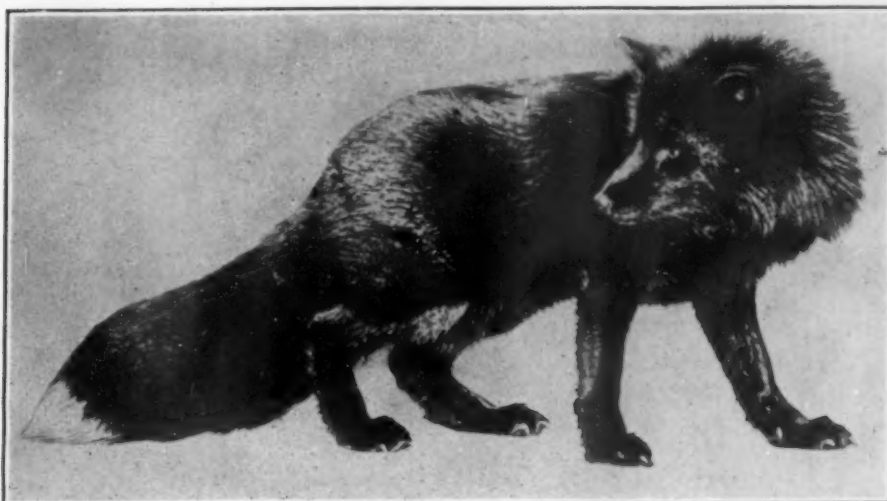
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CLASS STUDY HELPS

Articles on following pages will be found especially useful in science class work.

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Fur Coats Come from Foxes, Calves and Rabbits



THE KING OF THEM ALL—a dark silver fox of the finest type. (Photo by U. S. Biological Survey.)

By MARJORIE MACDILL

In no sense is it truer that Judy O'Grady and the Colonel's lady are sisters under their skins, than when all said sisters are under the skins of fur coats. No woman is quite completely happy, be she college professor's wife or ten-cent store clerk, until she has amassed the two hundred dollars' worth of cash or credit, plus or minus, that will shut out cruel Boreas' breath with pelts of real or pseudo-sable, muskrat or mole. It can be safely said that there is no material under the sun that woman buys about which she knows less, than this that she pays the most for.

Christmas brought a fuller realization of the great feminine ambition to American women than ever before. The recent announcement of the U. S. Biological Survey that our fur wearers are increasing faster than our fur bearers is bolstered up by figures that show how our annual import of furs jumped from \$87,000,000 in 1924 to \$115,000,000 in 1925. And this does not include the \$60,000,000 or \$70,000,000 worth that come annually from within our own borders and Alaska. Milady must have fur! In fact fur is being worn more this season in the United States than anywhere else south of the Arctic circle or north of the Antarctic.

Where do all the furs come from that supply the luxurious demands of these prosperous United States? The Siberian tundras, the pampas of the Argentine, the Himalayas of India and the barnyards of our own farms all contribute. According to a recent estimate, 55 countries sent furs to

America in the first three months of 1926.

The fur trade has always called to the adventurous spirit, and the high value set upon the stakes since the time when the wearing of fur was restricted by law to the aristocracy, though not to the gentler sex alone, have made the risks worth while. Though the difficulties of travel are considerably less, there is still a plentiful element of the uncertain in the life of the trapper and fur trader in many of the remote corners of the world where their calling takes them. The Yukon is traversable part of the time by motor boat and a railroad has been built into the Kyber Pass of Kipling fame. Camel caravans, however, still transport furs 800 miles over the Gobi desert from Urga to Kalgan, the nearest railroad station. This long trek can be cut down to two days by motor but between brigands, the Soviets, and Chinese generals it is not likely to lack variety.

The fur trade includes men of all nations, most of whom are in the game for business first and its sporting chances next, but in many hardy spirits the motives may be reversed. In this country by far the bulk of the trapping clan is made up of farm boys. About 100,000 divide up the sixty to seventy million dollars' worth of raw fur profits of America between them. One cause that swells the ranks of the boy trappers is the fact that in an agricultural country like ours vermin control is necessary for the protection of live stock, poultry and many crops. Larger animals that used to prey on the little ones have

become extinct, so that the smaller ones have continued to multiply in spite of the advance of civilization and consequently furnish material that starts many a farm boy's first bank account.

Though the primitive institution of barter plays an important part in fur buying in the Far North and sparsely settled places generally, Young America does business on a cash basis. The itinerant fur buyer haggles in the woodshed annex of the farmhouse over the price of skunk, muskrat, raccoon and whatever other skins the local streams and woodlands produce. His youthful adversary is usually as well posted as he on prices through the catalogs gotten out by the fur buying mail order houses, and the bargaining is likely to be both long and lively.

Sometimes the young trapper sells his catch to the receiving houses directly. Here there are plenty of disappointments in store for him for skins that are regal looking enough in the woodshed do not seem so impressive on the warehouse floor. On the whole, however, the reputable houses base their business on fair treatment, and good will is recognized as a valuable part of the stock in trade. Each individual skin is rated by experts according to its kind, size and quality and paid for proportionately.

The receiving houses usually dispose of their collections in lots to raw fur dealers. This dealer sorts his purchases and finds a market for each grade and kind, for each manufacturer specializes, first in either coats, neckwear or fur trimmings, then in the kind of skin, as muskrat, raccoon or beaver, and finally in price, such as popular, medium priced or costly garments. Catering to these numerous specialized factors is the function of the intermediate fur merchant. After going through all these hands only the best furs eventually reach the manufacturers since the inferior pelts are thrown out by the eliminating process in each selective buying. Auctions in raw furs are held by sales corporations from Seattle to St. Louis and New York to Winnipeg, as well as in London, Leipsic and Paris.

Though trapped over in some parts for nearly 200 years, the Mississippi basin still is a prolific source of small fur animals, Being an ideal section

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Fur Coats

(Continued from Page 35)

for wild life, it might reasonably be expected to harbor muskrat and opossum for years to come if it were adequately protected by wise conservation measures. Sensible laws in Delaware, New Jersey, Maryland and Louisiana have helped maintain miles of marsh land as homes for muskrats that turn out millions of pelts every year. A prominent authority in the fur industry, in a survey of the fur situation in the *Journal of Home Economics*, says that, "We must look to the conservation of natural resources as our guarantee of an adequate future supply. The fur trade and the various state and national agencies interested in national resources are working toward this end, and, I am happy to say, working harmoniously. Waste of wild life will eventually be eliminated and for it will be substituted intelligent 'conservation with use.'"

Fur farming is a development of recent years which will undoubtedly help to keep fur from becoming an extinct fashion. Nearly 2,500 farmers in the United States and Alaska are raising animals for their fur at the present time, and over \$15,000,000 is invested in this infant industry.

The production of silver foxes by breeding started as far back as 1887 and brought great wealth to the pioneers in the business. One consignment of 25 skins brought \$34,175 in and brought great wealth to the pioneer London market and at the height of the boom the top price for a single pelt reached \$2,700.

Since a great many people went into the business who had very little practical experience, a great deal of money was lost and illicit practices on the part of unscrupulous dealers did a great deal of harm in the new industry. The World War put a kink in the boom by killing the demand and breeding in this country has settled down to a sound stock raising basis with results less sensational but more stable.

According to Frank G. Ashbrook, in charge of fur bearing resources at the U. S. Biological Survey, fur farming is best carried on as a side line with general farming.

Mr. Ashbrook ventures to prophesy that in the future the majority of farmers in the northern tier of states will be raising some fur bearing animals on scrubby hillsides that will not grow wheat or oats.

Silver fox farming when carefully and intelligently managed makes money. Rabbit farming both for meat



CALVES RIVAL MUSKRATS and raccoons as a source of supply for chic sport models. This latest thing in black and white was once the everyday costume of a Holstein heifer.

and for fur has met with a measure of success in the West, particularly in southern California. Muskrat farming that is really not fur farming at all brings in a comfortable revenue. What is called muskrat farming is really regulated trapping with legal protection of marsh lands that result in perennial crops of this most prolific species for the fortunate owners of the swamp lands the muskrats love. Beaver and martin farming is still in the experimental stage and though mink reproduce rapidly in captivity they have not as yet proved money makers. Skunks and raccoons have been raised on farms, but the fluctuating prices of their pelts, dependent on such uncertain quantities as the whims of fashion and the financial manipulation of the market, have stood in the way of attempts to rear either animal on a large scale.

The aristocrats among furs like silver fox and mink do not receive

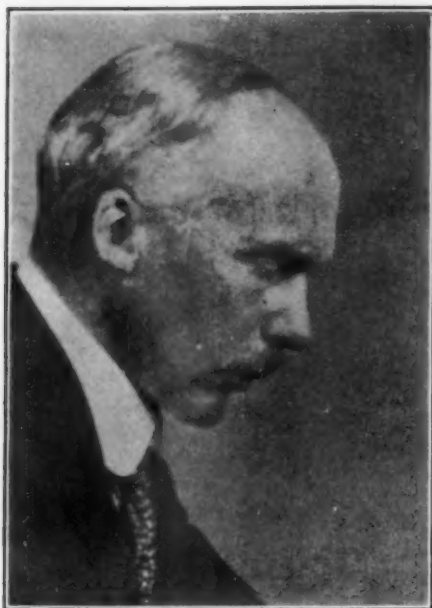
all the attention in the fur trade by any means. The lowly lamb, kid, pony, dog, house cat, and this season the barnyard calf, are all important sources of adornment for lovely woman. Persian lamb and caracul have long stood on the feet of their own appearance in general popularity, but sheared goatskin with leopard spots stenciled on it makes a striking substitute for the skin of the exotic feline from the tropics.

Furs are not made to masquerade for purposes of deception but to put them within the reach of all classes of society. In consequence we have American broadtail that originated on the back of a South American lamb. The wool next to the skin is particularly wavy and the close shearing produces a moire effect that exercises a strong appeal to the fur coat wearing share of the public. If you don't believe it, just stand on a busy corner and pick out all the moired lambs that go by!

Rabbit and muskrat skins masquerade as seal after a dye bath and their long guard hairs have been removed. Nutria, otter, beaver and real seal are other furs that are "un-haired" before they are made up into million dollar garments for movie princesses and bootlegger's brides.

On the other hand in some furs additional hairs are put in instead of taken out. Pointed fox is made by adding white hairs to red fox dyed black. White badger hairs are dipped in a special cement and stuck in wherever the desired effect demands their presence. The worker usually sits with the fur she wishes to copy in front of her as a model. Sometimes inferior dark silver fox skins are whitened by this same tedious hair by hair process. Nature's handiwork is further touched up by brushing dye into stripes with a feather or a fine brush, and old furs are renovated and light ones darkened by the same methods.

This season the farmyard has come into its own, for pony and calfskin are the favored choice of stenographer and debutante. The red-brown that reminds you of the heifer calf tied to the apple tree by the summer roadside back home is met with most frequently on the boulevards, but occasionally one sees a black and white Holstein tripping along above chiffon hose and alligator shoes. The last word comes from Europe where the Paris salons are showing flat haired skins decorated with hand painted flowers!



FRANK RATTRAY LILLIE

Scientist, Executive, Publisher

The recent retirement of Doctor Lillie as director of the marine biological laboratory at Woods Hole after eighteen years of service brought attention again to the new type of leaders which the past few decades have developed: men who combine the keenness and enthusiasm of research workers with executive capacity equal to that found in the commanders of large commercial enterprises. For by the coldest of all measurements, the cash criterion, the Woods Hole station is a large enterprise; it represents, in plant and investment, something like two million dollars. Its value in terms of benefits conferred on hundreds of biologists from all parts of this country and from all other countries of the world is of course beyond calculation.

Like many other able executives, Doctor Lillie has known how to hold down more than one job at once. He has been a teacher, mostly at his *alma mater*, the University of Chicago, ever since he received his doctor's degree there in 1894, and since 1906 he has been chairman of his department, that of embryology. In addition to his executive work he has kept up incessant research in some of the more difficult reaches of the embryological field, and has found time to edit three important scientific journals.

With Mrs. Lillie, he has given to the University of Chicago a magnificent new laboratory building for the new school of medicine, which he has dedicated to the memory of his old friend and colleague, Doctor Whitman.

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The Chemist and Poison Alcohol

By H. E. HOWE

Dr. Howe as editor of Industrial and Engineering Chemistry is in a position to state the chemical attitude toward the "poison" alcohol controversy now before the public.

Professionally the scientist is interested in but two sorts of alcohol. He requires the purest of alcohol, whether it be methanol, ethyl or grain alcohol, or one of the so-called higher alcohols for his research work. This in educational institutions can be obtained tax-free in accordance with established regulations. If he is connected with the industries, he recognizes that alcohol is second only to water in its importance as a solvent, and he requires large quantities at a low price for manufacturing purposes. Twenty years ago laws were passed to encourage industry by providing for denatured alcohol which could be sold tax-free, after having been rendered unfit for drinking by the addition of methanol or wood alcohol, pyridine, benzol, and a large number of other substances. These substances were chosen with a view to rendering the alcohol unfit for drinking without interfering with the industrial applications intended, and many chemists cooperated in devising the formulas which at one time or another have been approved by the Treasury Department.

The layman has little appreciation of the wide use of industrial alcohol and the fact that many materials cannot be made without it. Literally hundreds of thousands of dollars have been spent in an effort to find satisfactory substitutes for alcohol in the industry, since obviously no manufacturer would submit to present-day regulations on a basic raw material if he could use something else.

The practice followed by the federal authorities in denaturing alcohol is not materially different from that approved by many other countries; and indeed methanol, against which attacks have been launched in the past several months, is used in much larger quantities abroad than in alcohol denatured under the regulations of the United States Government. The industries have no objection to methanol and complaint comes either from those who desire to unravel denatured alcohol in order to divert it into beverage channels, or from the group who are opposed to prohibition and who have apparently decided to harass all and sundry to the point where they fancy some united de-

mand may be made for the repeal of prohibition. Whatever the individual views may be concerning prohibition, industrial chemists are united in opposition to the tactics being employed, which if continued in the press and by politicians may lead to a situation where industry will find it necessary to fight for a raw material that has become essential.

Care is taken to market completely denatured alcohol under poison labels. The material as it leaves the hands of the denaturer is not potable, and yet those who would criminally manipulate this material seek to charge the government with death which may occur from the illegitimate manipulation and use of this chemical compound. Industry finds it necessary to continue under existing conditions, while at the same time seeking the ideal denaturant which thus far no one has discovered. The alcohol producers have established a fellowship at Mellon Institute and have taken other steps to cooperate in this search.

If those who are so largely protesting the use of methanol do so in good faith, an equal amount of energy contributed to the effort to find an ideal denaturant would be far more constructive and much more in line with the interests of the industry as well as of the people at large.

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ENTOMOLOGY

New Cotton Pest Coming

A new enemy is at the gates of the burdened American cotton planters. Only two hundred miles south of the Arizona border Dr. A. W. Morrill of Los Angeles, California, has discovered a new species of cotton pest that is raising considerable havoc with cotton fields in northwestern Mexico. In areas where there is only an average infestation, the worms are causing twenty per cent. damage to the crop. The new pest shows an appetite for American uplands and Egyptian cultivated cottons, and for several species of Mexican wild cotton. Should it be carried into Arizona and California by winds the cotton boll weevil in this country would have an able assistant in his frustrated efforts at raising the price of cotton.

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Intelligence tests given to convicts in American prisons showed their average mentality to be higher than that of the guards.

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New York: Doubleday, Page & Co. 1923.
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New York: D. Van Nostrand Co. 1925.
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CHEMISTRY IN MODERN LIFE

By Svante Arrhenius, translated and revised by
C. S. Leonard. Library of Modern Sciences.
New York: D. Van Nostrand Co. 1925.
\$3.00.

DWELLERS OF THE SEA AND SHORE

By William Crowder.
Young People's Shelf of Science. Edited by E. E. Slosson.
New York: The Macmillan Co. 1923.
\$2.25.

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By Austin Clark. Library of Modern Sciences.
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Crime Situation Reviewed by Noted Criminologists

Scientists engaged in study of social and economic problems who came from all over the country to meet with the American Association for the Advancement of Science devoted three entire days to discussion of the American crime situation and law enforcement.

The spirit of lawlessness which seems to be growing in America, and which leads otherwise respectable citizens to break the prohibition laws, traffic laws, and taxation laws, was deplored by Dr. Hastings H. Hart, of the Russell Sage Foundation. Dr. Hart urged that Americans begin deliberately to cultivate a different attitude toward the law, especially among young people of the country.

Tax Laws Impossible

The subject of enforcing the tax laws was discussed in detail by Dr. Fred R. Fairchild, professor of political economy at Yale University. Dr. Fairchild showed how property and income tax laws are not being generally enforced.

"The reason," he said "is that as they are now constituted these laws are incapable of enforcement. The first step in the correction of this situation must be to frame laws capable of enforcement."

Dishonesty in business costs the United States somewhere between two and ten billion dollars a year, Dr. Joseph Mayer, of Tufts College, told the scientists. Methods of protection against dishonesty in business have simply not kept pace with our industrial expansion, he declared.

The crime of arson was particularly mentioned by Dr. Mayer, because it threatens not only property, but life itself.

Arson a Profession

"It has been estimated that nearly 50 per cent. of the loss by fire is due to arson-burning property to defraud," he said. "During 1924 the fire loss given by the National Board of Fire Underwriters of New York was approximately \$549,000,000, of which \$220,000,000 was due to incendiaryism. Arson has become a profession. It is closely allied to fraudulent bankruptcies and other forms of commercial crime."

Dr. Mayer stated that in the women's clothing industry, where profits depend on getting rid of stock before styles change, there are so many fires wiping out old, unsalable stocks, that some fire insurance companies in New York refuse insurance to clothing manufacturers.

Other commercial criminals de-

scribed by Dr. Mayer included the fake stock salesman, the embezzler, forger, and the crooked promoter of real estate.

In conclusion, he said that the time has come for the Federal Government to take drastic action against commercial dishonesty. "The Federal Trade Commission's powers should be extended or another agency created to ferret out what has already been labeled as criminal in commercial dealings," he said. "Such a federal bureau, in cooperation with the states, private agencies and the courts, should go far to bring the commercial crime situation under control."

Pistols Plentiful

"The pistol is the curse of America and pistols are almost as plentiful as lead pencils in this country, good citizens and bad citizens possessing them," declared William McAadoo, chief city magistrate of New York. Mr. McAadoo refuted the argument that criminals in this country go armed, while honest citizens cannot protect themselves because of the laws against carrying weapons.

"The pistol as a defensive weapon is utterly useless in the hands of a law-abiding, orderly citizen because of the element of surprise on the part of the burglar," he stated. "Time and again bank messengers loaded with pistols have been shot down by robbers who carefully planned the attack."

People who want pistols get them easily, he said, showing that the number of pistols made and imported into America would indicate that from 50 to 75 per cent. of the population in the United States is armed.

"Numerous fortunes are made by the mail order agencies and houses selling pistols. One man in New York confessed to the police that he had made \$400,000 in two years sending pistols through the mails," said Mr. McAadoo.

Take Profit From Crime

The crime business in this country offers dishonest and weak individuals greater financial returns and less chance of failure than legitimate business. This angle on the crime situation was stressed by James M. Hepbron, managing director of the Baltimore Criminal Justice Commission.

It has been proved that criminals are slightly superior in intelligence

to the average citizen, and they consider chances of success and failure of an undertaking just as the average man does, Mr. Hepbron declared.

"When apprehension becomes more certain," he continued, "trial more prompt, conviction of the guilty swift and sure and punishment adequate, professional criminals are brought to realize that the game isn't worth the candle. Crime as a business is like any other business. When you take the profit out of it, it collapses."

The work of Baltimore's crime commission was explained by the speaker, who told of the improvements it has brought about in the local administration of justice.

"Whereas several years ago only one reported crime in every five or six was followed by arrest, now arrests take place in one of every two reported crimes," he said. "Cases are tried with a degree of promptness unparalleled in the United States as far as any known records show, as 92 per cent. of the cases tried are tried within three weeks of the date of arrest."

Ten citizens' associations combating crime are now in existence in the United States, Mr. Hepbron reported.

Stealing Learned at Home

A dozen ways in which a child may learn to steal in its own home were cited by Dr. Thomas V. Moore, psychiatrist of Washington, D. C., in a discussion of juvenile delinquency.

Dr. Moore said:

"The parent who, perhaps from a false idea of economy, never gives a child spending money; the parent who talks openly before the children of debts that are unpaid; the parent who continually talks before the children of the good things of this life and holds up money, place, position, station, pleasures, as the only object of human ambition; the parent who has no religion and gives the children no moral principles; the parent who, perhaps through poverty, sends the child to steal coal from a neighboring car on a side-track; the parent who sends the little boy or girl to steal money from a drunken father's pockets; the parent who steals himself and brings home the product of stealing, the parent who does not become the

(Just turn the page)

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ILLINOIS

Crime Situation

(Continued from Page 39)

companion and guide of the child as the child grows to maturity—all of these are factors in the background of the child who grows up to have no respect for the property rights of others, and who therefore steals."

The psychopathic individual who plays so important a part in juvenile crime records is the result of a defect transmitted directly by heredity, Dr. Moore believes. The dominant roots of the disorder, he said, are probably alcoholism and syphilis, and whatever is done to control these social evils is an indirect but radical treatment of juvenile delinquency. Moral training should be given boys and girls at school, and good examples set before them at home, he said.

Insanity Problem Solved?

The practice of calling psychiatrists into a criminal court to testify that a defendant was not responsible for his misdeeds was deplored by Dr. Sheldon Glueck, instructor in criminology at Harvard University.

"It is no more fitting that a purely scientific psychiatric examination be made in open court and under rules of evidence than that a patient with possible diphtheria or some other bodily ill be brought into court on a stretcher and examined subject to the eagle eye of judge or jury and the non-medical majesty of the law. The heat of a forensic battle is bound to interfere with any scientific, objective examination of the defendant."

How Massachusetts has taken the lead of the states in providing for unbiased psychiatric examination for certain prisoners, and how the system works was described by Dr. Glueck. Psychiatric experts from the state's department of mental diseases have the task of examining certain types of prisoners when reported to them by the clerk of the court. These are prisoners indicted for capital offenses, those known to have been indicted for any other offense more than once, or to have been previously convicted of a felony. The experts in mental and emotional disorders report whether or not it would be a waste of time and expense to try the accused person and whether or not it would be inhumane to bring him into a public court for trial.

During the five years that the law has been in force, 295 accused per-

(Continued on page 41)

BIOLOGY

NATURE RAMBLINGS

By FRANK THONE



55

Two Unwanted Guests

Man has, with infinite labor, made domesticates of a number of his lower brother animals, to serve him; and he has admitted a lesser few into the privileged position of housemates. There are others that have domesticated themselves and become man's housemates whether he will or not, but they never serve him, and they take no thought at all of pleasing him. They stick to him more faithfully than do his dog and cat, and try as he will he can not get rid of them.

Of such is the clan of the cockroach. Let a man build his house never so tight and dry, let his wife keep it never so clean, sooner or later this sleek dark mephistophelean insect will come scuttling up the plumbing, and establish its numerous progeny in almost undislodgable possession. It is like the rat; always with man and always hated by him.

But it was on this planet long before either man or his works, and in sooth most cockroaches even now never trouble human dwellings. The original cockroaches were, as their less known and therefore less offensive descendants still are, dwellers in the forest, making their homes among fallen leaves and under the loosened bark of dead logs. And they had strange leaves and logs to dwell in, too, for they were in the Coal Age, some twenty millions of years ago.

The odd thing about it is that though almost all the other animals and plants of the earth have passed through the most astonishing changes in evolution since then, these original cockroaches were so much like the n-th degree great-grandchildren that if one of them were to appear in a modern kitchen the least scientific of housewives would reach for her broom without an instant's hesitation. Cockroaches are very conservative—they neither believe in evolution nor practise it.

(Just turn the page)

ENTOMOLOGY

Corn Borer's Appetite

Results of breeding experiments in which European corn borers were reared, in Ohio, on plants other than corn, are reported by C. R. Neiswander and L. I. Huber of the Ohio agricultural experiment station. It was found in the breeding experiments that the borers fed as readily on smartweed, ragweed and dahlia as on corn, while but few larvae were able to reach the full grown stage on sorghum or celery, and not a single borer reached this stage on pigweed, potato and velvet leaf, they stated. The borer is quite commonly found in pigweed, smartweed, and cocklebur in heavily infested cornfields but, so far as is known, occurs there only by migration from corn where the eggs were deposited and the young larvae fed.

Science News-Letter, January 15, 1927

Crime Situation

(Continued from Page 40)

sons have been examined, Dr. Glueck said. Of the 295, 26 were declared insane, 25 were mentally deficient, and 11 were psychopathic cases, which belong on the borderline of mental disorder, and are considered partly responsible for their acts. In 226 cases no evidence of mental abnormality sufficient to call for treatment or other special disposition was discovered.

A large percentage of those found to be mentally deficient were committed by the courts for an indeterminate period to the special institution for defective delinquents. Others were put through the usual court trial and given brief definite sentences, although Dr. Glueck stated, "for the benefit of themselves and society they should have been disposed of as the former group were."

As matters stand throughout the country, persons who are dangerous to general security because of some mental defect or disorder are frequently not detected until after they have committed some shocking crime, the criminologist said. The Massachusetts law, he declared, makes it possible to discover such individuals early in their delinquent careers and to protect the public against them.

Science News-Letter, January 15, 1927

Soil problems of the southern sand hill belt are to be studied by the U. S. Department of Agriculture at a new southern test farm.

ETHNOLOGY

Weevil Waves Start Small

Despite the remarkable way insects learn to adapt themselves to environment, the cotton boll weevil is still a little non-plussed about how to deal with the alternate freezes and thaws of a winter in the more northern cotton states.

F. A. Fenton of the United States Bureau of Entomology states that less than one per cent of weevils in northern South Carolina survive long enough to produce the summer generations that infest cotton. A larger proportion actually survive the winter but die in the spring before their cotton food is at hand.

Yet this region is heavily infested with the weevil each year. This is because even the few surviving are sufficient to produce thousands of weevils. The weevils breed rapidly, each surviving female laying about 600 eggs before she dies.

Science News-Letter, January 15, 1927

FORESTRY

Tree Efficiencies Measured

How to make our forests more efficient is the aim of investigations carried on in the Rocky Mountain Forest Experiment Station at Colorado Springs by C. G. Bates and J. Roeser. By growing seedlings of various kinds of evergreen trees on a table under the light of tungsten-filament blue-glass lamp for ten hours a day for nine months they determined the limit of light essential for the development of each kind of tree. They found that some species were five times more efficient than others at trapping the roving rays and utilizing their energy for construction purposes. The California redwood ranked first in efficiency as light-catcher, for it could keep alive with less than four-fifths of one per cent. full noon sunshine. Engelmann spruce and Douglass fir ranked next with one and a quarter per cent. Most of the pines require two to three per cent. while the scrubby pinon of the Colorado foothills, failed to flourish with even thirteen per cent. of sunlight intensity. This accounts for the phenomenal ability of the redwood and spruce to make rapid growth in shade of deep timberland and shows why they have outstripped many other trees in evolutionary development. Mr. Bates concludes: "Broadly speaking, we can not afford to give space in the forest to a species which is relatively inefficient in photosynthesis, unless it is producing a wood of exceptional technical value."

Science News-Letter, January 15, 1927

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Nature Ramblings (Continued from Page 41)



55

"The moth is the most economical animal. It eats only holes."

That is one the oldest jokes in the English language. But to one-half of the population, the feminine half, it has never been funny, and it will probably reach twice and thrice its present hoary antiquity without getting a woman to really laugh at it. They may smile at it, but even that will be a bit ruefully. Holes in winter clothes are not humorous.

The desperate swoopings and hand-smackings after fluttering gray insects, however, do little good against the menace of moths. These flutterers are only wandering males, that lay no eggs. The real danger lies with the prolific females, and they are wingless and hence are seldom seen. Kill the relatively insignificant male if you want to, but take him mainly as a symptom. Go and see whether the chewing grubs or larvae are in your closet. If they are, turn all folded or rolled surfaces outward, brush everything thoroughly, and hang outdoors—the colder the weather the better. Use a chemical moth preventive if you like; some of them are quite effective, and most of them will help at least a little. But brushing and airing should be the main weapons.

The clothes moth is one of the riddles of animal physiology. Throughout its life, throughout countless generations of its lives, it has never swallowed anything but chewed animal wool or hair. There is food enough in such a diet, but how does the creature get its water? To that question, nobody has yet given a satisfactory answer.

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The standard milk ordinance worked out by the Public Health Service has been adopted by 100 cities, to improve milk sanitation.

Timber used to build the famous battle ship, "Old Ironsides," was cut mainly from St. Catherine's Island, off the Georgia coast.

The bones of *Pithecanthropus erectus*, the oldest remains resembling a human being so far discovered, are preserved in a Dutch museum.

RADIO

Transocean Radiophone

Hard times are in store for any transatlantic gossips who might wish to indulge in a little eavesdropping on the new overseas radiophone service which opened for public use on Friday, January 7. Officials of the American Telephone and Telegraph Company state that although absolute secrecy of the transatlantic telephony is not guaranteed, it will be difficult to listen in because a special transmitting system is used. This is the suppressed carrier method, by which the voice is sent through the ether without a carrier wave. In the ordinary receiver, an unintelligible jumble is all that one hears, but when a receiving set is used that restores the missing carrier, it is fully understandable.

Another difficulty of listening in, at least so far as the United States is concerned, is that the signals from London are so faint. It was in order to get them as loud as possible that the telephone company placed the receiving set at Houlton, Maine, 700 miles of long distance lines away from New York, so that at best, an interloper would only be able to hear one side of the conversation.

For the present, it is only possible for connections to be made between New York and London, although, experimentally, points as far away as Chicago have been connected with England, and there are no difficulties foreseen in possible connections with San Francisco. If there is sufficient demand, it was stated, other parts of the United States will be given the service. Even now, it is possible to connect any of the one and a half million telephones in New York with any of the half million in London, provided the subscribers wish to pay the rates. The charges for the service are \$75 for the first three minutes or less, and \$25 for each additional minute, the maximum time allotted being twelve minutes if any other calls are waiting. At present, it is only possible to have one conversation across the Atlantic at a time, but by the use of additional wave lengths, with additional equipment, more channels for conversations may be made in the future.

One improvement that has been made, since the first experimental tests a year ago, in the interest of conserving the limited number of available wave lengths has been to transmit both directions on the same wave length. Previously, a different one was used between England and the United States from the one used to

carry the conversation eastward. In order that the speaker may not hear his own voice coming back to him through the receiver, voice operated relays are used which connect the receiving circuit only when the person at the other end is talking. A similar device is already in use in long distance land cables to prevent echoes by the reflection of the currents at ends of the circuit.

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ASTRONOMY

Sun Laziest Now

Although the shortest day of the year was the beginning of winter, December 22, the sun now gets up over the eastern horizon a few minutes later than on that day.

This apparent laziness of the sun is due to the fact that earthly clocks keep their time by what astronomers call the "mean sun" rather than by the true sun and that therefore the sun is directly on the meridian at high noon on any day of the year except about April 15, June 15, August 31, and December 24. The late rising of the sun is compensated for during these January days by the even later setting of the sun so that the daylight period is actually lengthening. The time of earliest sunset occurred sometime between December 2 and 14.

The irregularity of the true sun is well realized by those who rely on sundials for their time. The difference in time between that kept by the true sun, recorded on the sundial, and the mean sun, by which clocks are set, is called the equation of time. The necessity for this equation of time is due to two factors, the eccentricity of the earth's orbit about the sun, and the obliquity of the ecliptic or path in which the sun appears to move around the earth. This path does not encircle the sky directly over the earth's equator, but is at an angle of $23\frac{1}{2}$ degrees from the celestial equator. These two factors combined make the sun seem to be "slow" at this time of the year.

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A French inventor announces that he has been able to take motion pictures at the rate of 300 a second.

Two ore crushers just built weigh 1,000,000 pounds each and are said to break the record for size in such machinery.

Examination of American soldiers during the war showed for the first time the distribution of goiter through the country.

MINERALOGY

Opal Weighs Over Pound

Half as big as a brick, pitch black but shot through with green and peacock blue fire, the largest known gem opal is now residing in the U. S. National Museum. The big opal is a simon pure "made in U. S. A." product, having first seen light of day in Virgin Valley, Humboldt County, Nevada. It came to the museum as a part of the famous mineral collection of the late Colonel Washington A. Roebling, just presented to the Smithsonian Institution by his son, John A. Roebling.

The finest opals are generally considered by experts to come from Australia, but this huge gem that weighs over 18 ounces avoirdupois is surpassed by few in quality and beauty. The region around Virgin Valley, where gem opals were first found in 1908, is largely desert. The opals occur, according to Dr. W. F. Foshag, mineralogist in the National Museum, in beds of volcanic ash associated with petrified wood. Sometimes the chinks and cracks of a piece of petrified wood are completely filled up with opaline flashes of blue and red. Occasionally one finds a whole opal twig, while the University of California mineral collection contains a spruce cone completely changed to opal, Dr. Foshag said.

Science News-Letter, January 15, 1927

ANTHROPOLOGY

Age of Man in America

Dr. Ales Hrdlicka, President of the American Anthropological Association, subjects to sharp criticism the frequent reports appearing in the newspapers of finds of the remains of fossil man in America. The stories of the discovery of bones of prehistoric dwarfs or giants are obviously absurd and even the plausible of such announcements lack substantial foundation. The sensational report by a curator of a western museum of rock carvings of man in company with extinct lizards and elephants was wholly erroneous, Dr. Hrdlicka declares. The row of teeth found in a slab of hard rock of Eocene Age and pronounced by one of the foremost dental journals to be human were found on closer scrutiny to be those of an ancient horse. There is no decisive evidence of the existence of man in America as early as the Glacial epoch or even of the arrival of any men, except the Indian and Eskimo, coming from other continents before Columbus, he claims.

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110 Metaphysics
120 Special metaphysical topics
130 Mind and body
140 Philosophical systems
150 Mental faculties. Psychology
160 Logic
170 Ethics
180 Ancient philosophers
190 Modern philosophers
200 RELIGION—
210 Natural theology
220 Bible
230 Doctrinal. Dogmatics. Theology
240 Devotional. Practical
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First Glances at New Books

CLIMATE THROUGH THE AGES—C. E. P. Brooks—*Coleman* (\$5).

The geologist and paleontologist, who have solid rocks and equally solid petrifications to go on, have a relatively easy time, and hence their sciences are already well developed. But climates do not fossilize, and the paleoclimatologist has had to lean on his colleagues. The science of the climates of the past, however, is now rounding into definite form, and will in its turn be of great assistance to its older sisters. The present work speaks well for the development so far, and augurs well for the future.

Science News-Letter, January 15, 1927

PRACTICAL COLLOID CHEMISTRY—Wolfgang Ostwald—*Dutton* (\$2.25). A pioneer in colloidal affairs gives directions for some beautiful experiments.

Science News-Letter, January 15, 1927

INDUSTRIAL PSYCHOLOGY—Charles S. Meyers—*People's Institute*. (\$2.50). If the industrial civilization of the Occident is to continue, it becomes increasingly obvious that the strains it imposes be kept within the limits of human tolerance. Well-digested knowledge of a book such as Dr. Meyer's should be a required part of the equipment of every industrial executive, from foreman up.

Science News-Letter, January 15, 1927

CORRESPONDENCE SCHOOLS, LYCEUMS, CHAUTAUQUAS—John S. Noffsinger—*Macmillan* (\$1.50).

The results of a survey of the institutions most popularly resorted to by the great mass of Americans who feel that their schooling has been incomplete but who are unable to resume or continue attendance at the usual types of school. The author believes that correspondence schools especially are entitled to recognition, and that the system would profit by closer legislative regulation.

Science News-Letter, January 15, 1927

A NATIONAL PROGRAM OF FOREST RESEARCH—Prepared by Earle H. Clapp—*American Tree Association*.

One of the foremost of our national agencies for the redemption of American forests takes stock of the present situation and recommends action for the future. A whole encyclopedia full of forest information has been boiled down into the 232 pages of this book.

Science News-Letter, January 15, 1927

PHYSICS

Our Dependence On Light

Quotation from introduction to Erwin Freundlich's *THE FOUNDATION OF EINSTEIN'S THEORY OF GRAVITATION* by H. H. Turner. Cambridge, England, The University Press. Dr. Turner is Savilian Professor of Astronomy at Oxford University.

The Universe is limited by the properties of light. Until half a century ago it was strictly true that we depended upon our eyes for all our knowledge of the universe, which extended no further than we could see. Even the invention of the telescope did not disturb this proposition, but it is otherwise with the invention of the photographic plate. It is now conceivable that a blind man, by taking photographs and rendering their records in some way decipherable by his fingers, could investigate the universe; but still it would remain true, that all his knowledge of anything outside the earth would be derived by the use of light and would therefore be limited by its properties. On this little earth there is indeed a tiny corner of the universe accessible to other senses; but feeling and taste act only at those minute distances which separate particles of matter when "in contact"; smell ranges over, at the utmost, a mile or two; and the greatest distance which sound is ever known to have traveled (when Krakatoa exploded in 1883) is but a few thousand miles—a mere fraction of the earth's girdle. The scale of phenomena manifested through agencies other than light is so small that we are unlikely to reach any noteworthy precision by their study.

Few people who are not astronomers have spent much thought on the limitations introduced by the news agency to which we are so profoundly indebted. Light comes speedily but has far to travel, and some of the news is thousands of years old before we get it. Hence our universe is not co-existent: the part close around us belongs to the peaceful present; but the nearest star is still in the midst of the late War, for our news of him is three years old; other stars are Elizabethan, others belong to the time of the Pharaohs; and we have alongside our modern civilization yet others of prehistoric date. The electric telegraph has accustomed us to a world in which the news is approximately of even date; but our forefathers must have been better able, from their daily experience of getting news many months old, to realize the unequal age of the universe we know. Nowadays the inequality is almost entirely the concern of the astronomer, and even he often neglects or

forgets it. But when fundamental issues are at stake, the time taken by the messenger is an essential part of the discussion, and we must be careful to take account of it, with the utmost precision.

Our knowledge that light had a finite velocity followed on the invention of the telescope and the discovery of Jupiter's satellites: the news of their eclipses came late at times and these times were identified as those when Jupiter was unusually far away from us. But the full consequences of the discovery were not realized at first. One such consequence is that the stars are not seen in their true places, that is in the places which they truly held when the light left them (for what may have happened to them since we do not know at all—they may have gone out or exploded). Our earth is only moving slowly compared with the great haste of light; but still she is moving, and consequently there is "aberration"—a displacement due to the ratio of the two velocities, easy enough to recognize now, but so difficult to apprehend for the first time that Bradley spent two years in worrying over the conundrum presented by his observations before he thought of the solution. It came to him unexpected, as often happens in such cases. In his own words—"at last when he despaired of being able to account for the phenomena which he had observed, a satisfactory explanation of them occurred to him all at once when he was not in search of it." He accompanied a pleasure party in a sail upon the River Thames. The boat in which they were was provided with a mast which had a vane at the top of it. It blew a moderate wind, and the party sailed up and down the river for a considerable time. Dr. Bradley remarked that every time the boat put about, the vane at the top of the boat's mast shifted a little, as if there had been a slight change in the direction of the wind. The sailors told him that this was due to a change in the boat, not the wind; and at once the solution of the problem was suggested. The earth running hither and thither around the sun resembles the boat sailing up and down the river: and the apparent changes of wind correspond to the apparent changes in direction of the light of a star.

Science News-Letter, January 15, 1927

In the fourteenth century the standard for an inch measure was three barley-corns round and dry taken from the middle of the ear.

The Problem of Translation—

¶Science, probing the unknown universe, writes its findings in cryptic language. A stellar galaxy shining faintly in the heavens hides its splendor and its immensity in numbers and formulæ; a minute germ has thrust upon it a long Latin name. With the aid of such scientific shorthand and such technicalities, science pushes on to new discoveries and new heights.

¶Yet the facts and the methods of science must penetrate and permeate the whole fabric of civilization if the world is to become an increasingly better place to live in. The man in the street, the child in the school, the merchant in the counting house, the judge on the bench, the priest in the temple, all of those who make the world, must know, appreciate, understand and cherish the spirit of research and the power of thought.

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Anniversaries of Science

January 19, 1910.—The Southern Health Conference was organized at Atlanta, Georgia, to fight hookworm disease.

The symptoms of hookworm infection were vaguely outlined in the Egyptian papyri, and for centuries the disease was variously known as Egyptian or tropical chlorosis, miner's or bricklayer's anemia, and St. Gothard tunnel disease. . . . In 1900, Captain Bailey K. Ashford, U. S. Army, discovered the great prevalence of the disease in Porto Rico, and it was soon found to be very common among the rural population of the Southern States by Charles Wardell Stiles. . . .

Stiles . . . has since devoted himself, as professor of zoology in the U. S. Public Health and Marine-Hospital Service, to the task of exterminating the disease in the South, in connection with the Rockefeller Commission established for this purpose in 1909. . . . In three years (1910-1912), no less than 393,566 persons have been treated for hookworm at these open-air clinics in the Southern States.

—Garrison: *History of Medicine*.

January 20, 1907.—Death of Mendeleeff, who first showed the periodicity of properties of the elements when arranged in the ascending order of their atomic weights.

The soundness of a theory is best exemplified by the use to which it can be put. Does it explain anomalies? Does it guide along future paths of investigation? The Periodic Law has more than fulfilled these requirements. As a beacon it stands out as prominently in the history of chemistry as does Dalton's Atomic Theory, which is at the very foundation of our science today. Some of the most startling discoveries of our time, such as the rare gases of the atmosphere and the radioactive elements are directly attributable to the Periodic Law.

—Harrow: *Eminent Chemists of Our Time*.

January 22, 1560/61.—Birth of Francis Bacon.

Bacon, because of his official position and immense philosophical and literary ability, was able to draw universal attention to the methods of science and especially to the method of investigation of induction, so that his indirect service to science was great. Bacon's true place in science was, however, well understood by his contemporaries, for one of the greatest, Harvey, discoverer of the circulation of the blood, remarks that, "the Lord Chancellor writes of science like—a Lord Chancellor."

—Sedgwick and Tyler: *A Short History of Science*.

January 23, 1911.—Oceanographic Institute, built by Prince of Monaco was opened at Paris.

Notable voyages of scientific discovery were made by the late Prince Albert I of Monaco. He was a scientist even more than a prince, and not only devoted great sums to building and equipping special ships for ocean investigations, but went to sea himself and took a vigorous part in the actual investigating.

—Abbot: *How Deep is the Ocean* in Smithsonian Reports, 1922.

Science News-Letter, January 15, 1927

ZOOLOGY

Evolution of Whales

How whales have changed from land animals to the denizens of the deep they now are is one of the problems of science which Remington Kellogg, associate biologist of the U. S. Bureau of Biological Survey, is unravelling by studying the fossil remains of the great sea beasts' hearing organs.

At the annual exhibit of the Carnegie Institution of Washington, Mr. Kellogg displayed a complete collection of these fossilized "ears" from the time of the early Eocene down to the present.

The ancestors of the present day whales heard with ear drums just as humans and others animals do, but as the force of circumstances, that geologists do not yet understand, compelled them to take to the sea for a living their different organs underwent various modifications. The family of sea mammals that are known as whalebone whales eventually lost their external ears and the external auditory tube became completely closed to preserve the eardrum from rupturing under the pressure that prevails at great depths in the sea. They have acquired in addition an elastic cartilage arrangement around the blow holes on the top of the head that closes tighter the farther they go down.

As a result the whalebone whales now actually hear through their noses and the eardrum has become useless. They have developed in its place a bony structure coiled up like a conch shell known as the bulla. The ear bones are the hardest bones in the body of the whale and for this reason have survived in fossilized form where the other bones have disappeared entirely. In some prehistoric species, says Mr. Kellogg, it is the only bone there is available for study. For this reason science has an unusually complete record of the gradual stages by which the whalebone whales acquired their present kind of organ of hearing.

The actual process by which these coiled conch shell bones receive sound waves is a problem that puzzles both physicists and biologists. The fact that whales are usually shrewd in detecting danger that can only be conveyed by sound, is considered, however, as a demonstration of its efficiency as an organ of hearing.

Science News-Letter, January 15, 1927

Over three-fourths of the dogs in this country are mongrels.

BIOLOGY

Electricity Fathers Worms

The first stages of growth of the eggs of a common sea worm, *Nereis*, have been produced in the laboratory, with no other father than an electric wire, by Dr. Ware Cattell of Memorial Hospital. The work was done at the marine biological laboratory at Woods Hole, Mass., during the summers of 1925 and 1926, but has just been reported.

Dr. Cattell placed egg-bearing female worms in dishes of sea water, and turned an electric current on them with specially designed apparatus. The shock caused them to discharge their eggs, which were subsequently found to be acting as though they had been fertilized in the normal manner with the male elements. A part of these electrically activated eggs carried on growth as far as the earlier stages of larval life.

During the past few years, unfertilized eggs of many species of animals have been caused to develop, sometimes to advanced stages, by chemical treatment, heating, pricking with needles, and a number of other stimuli; but the present experiment is the first in which an electric shock has performed the function of parenthood.

Science News-Letter, January 15, 1927

GEOGRAPHY

Center of North America

Devil's Lake, famous scenic region in North Dakota, has now attained a new distinction: it marks the center of the North American Continent. The Map Information Office of the U. S. Board of Surveys and Maps has just finished a new determination of the geographic center of North America, as accurate as can be obtained from the most recent maps. This estimate places the spot at 48 degrees 10 minutes north latitude and 100 degrees 10 minutes west longitude. This is a few miles to the west of Devil's Lake, but the lake is the nearest prominent feature on the map, and so becomes a natural center monument.

Science News-Letter, January 15, 1927

ASTRONOMY

Errors Corrected

Two typographical errors appeared in the SCIENCE NEWS-LETTER, January 1, XI, 10, in the article, "Coming Astronomical Year." In line 9 of the first column, "the bright north star" should read "the bright star north." In line 10 of the third column, "east" should read "west."

Science News-Letter, January 15, 1927

SCIENCE FOR THE MILLIONS

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